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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.: 09/754,762

Applicant: Lewis et al.

Filed: January 4, 2001

Title: Method and Apparatus for Filing Stock Orders

TC/A.U.: 3653

Examiner: Jeffery A. Shapiro

Att. Docket No.: 29488/36815

I hereby certify that this paper and the documents referred to as enclosed therewith are being deposited with the United States Postal Service, first class postage prepaid, addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: 9/1/06

Randall G. Rueth
Reg. No. 45,887

DECLARATION OF JIMMY RANDOLPH LEWIS AND SEAN GARY MCGONAGLE UNDER 37 C.F.R. § 1.131

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

We, Jimmy Randolph Lewis and Sean Gary McGonagle, hereby declare the following:

1. We are the original, joint inventors of the subject matter claimed and disclosed in the above-captioned application.

2. We have been informed that the above-captioned application, U.S. Application Serial No. 09/754,762 was filed January 4, 2001 ("the Application").

3. We submit this Declaration for the purpose of providing evidence that the subject matter claimed in the Application was conceived and reduced to practice in the United States of America as of a date prior in time to April 24, 2000.

4. We have also been informed that Japanese Patent JP 2000-118641 to Takizawa (hereinafter, "Takizawa" a copy of which is attached hereto as Exhibit "A") was cited against the claims pending in the Application.

5. We have been informed that the effective date of Takizawa as an alleged prior art reference is April 24, 2000.

6. We have read and understood Takizawa, attached as Exhibit A.

7. To establish the conception date of our invention prior to April 24, 2000, we provide evidence in the form of drawings, inventors' notes, and internal proposals (copies of which are attached hereto as Exhibits "B" through "E") which describe facts relating to each and every element of claims 7, 8, 10-19, and 21-28 as required by MPEP 715.07 to satisfy 37 C.F.R. §1.131. The exhibits describe the invention of the above-noted patent application, and specifically include a description of a method and apparatus for filing stock orders. In particular, the exhibits describe a method and apparatus of filing stock orders in a "pick to light" system that includes at least one number display for showing a desired quantity of each stock item; at least one container display for showing a unique container identifier associated with a selected container into which each stock item is to be placed, wherein each container is assigned a unique identifier; at least two location indicators associated with the storage bins, a first location indicator comprising a light associated with each storage bin, and a second location indicator comprising a direction display; and a computer operably coupled to the lights, the at least one number display, the at least one container display, and the direction display, wherein the computer receives the orders for the stock items and assigns a selected container to each stock item, directs the at least one number display to show the desired quantity of the stock item in a current pick operation, directs the at least one container display to show the unique container identifier associated with the selected container assigned to the current pick operation, illuminates the light for the storage bin associated with the specific

stock item in the current pick operation, and operates the direction display to indicate a direction of a storage bin associated with a subsequent pick operation.

8. To establish a date of actual reduction to practice of our invention prior to April 24, 2000, in Exhibit B we provide notes written by Sean McGonagle indicating the problems associated with previous systems to include pickers "hav[ing] to turn around" during the pick process (Exhibit B, page 1, "Picking"). Further, in the front-view illustration of the "Human A-Frame" we clearly designate "Lite Strips" and a "Bay Controller" to indicate a light associated with each bin and a computer operably connected to the lights (Exhibit B, page 4, "Picking").

9. In Exhibit C, we provide a document entitled "Pick to Bucket Design Criteria" that we provided to vendors during the testing phase of invention development. In the document, we refer to a "Pick to Light System to put the product into a hopper indicated by a light that contains the picks...." (Exhibit C, Page 1, "General Description"). Further, we discuss "hoppers" that "provide an area for mounting the Walgreens Pick to Light system (PTL)." (Exhibit C, Page 1, "Functional Requirements"). We also disclose a "Control System" that, among other things, "provide[s] an indication to the picker via pick to light" and assign[s] a section of belt" to an order of hoppers. (Exhibit C, Page 1, "Control System").

10. Further, we provide a document entitled "Pick-To-Bucket Order Processing System Proposal" in Exhibit D. On a date prior to June 30, 1999, we submitted Exhibit C "Pick to Bucket Design Criteria" to SI Handling Systems of Easton, Pennsylvania. Working with our input, SI Handling Systems developed the proposal dated June 30, 1999. As a result of our direct input and the submitted design criteria of Exhibit C, the system disclosed in Exhibit D includes a "[p]ick-to-light" feature with "[p]ick bucket indicator lights and acknowledgment buttons" (Exhibit D, page 2, section 1.3, "Walgreens Responsibilities").

Also, the proposal describes that "items are placed into a bucket indicated by a light" to reference a light associated with each bin (Exhibit D, page 2, section 3.0, "System Description"). The proposal further describes computers as a "PTB control system" and a "BRTS Control System" operably coupled to the lights (Exhibit D, page 2, section 3.0, "System Description" and page 4, section 5.0 "BRTS Control System").

11. Also, notes describing our invention and its pick-to-light features are provided as Exhibit D. In handwritten notes dated April 11, 2000, we describe a "PTL [Pick-to-Light] to direct picker" that reduces or eliminates "time lag for recognition" (Exhibit D, page 1, "Walgreens Claims"). The notes also include a "Pick Arrow Indicator" that "directs [a] pick[er] to [the] correct area of [the] pick" and a "Display Bin (Tray) location on [the] rack" that allows the "picker [to] know when they turn where pick will be..." (Exhibit D, page 1, "Walgreens Claims").

12. By proposing and developing a pick-to-light system to include the elements discussed above and disclosed in Exhibits B, C, D, and E, we concluded, prior to April 24, 2000, that we conceived and completely reduced to practice at least the inventions recited in the pending claims, thereby satisfying the object of the present application as evidence of actual reduction to practice.

13. We created the notes, drawings, and proposals in the United States of America, where our invention was also conceived, prior to April 24, 2000. We support this assertion with the attached Exhibit D dated June 30, 1999 showing a "Pick-To-Bucket Order Processing System Proposal" that resulted from our submission of Exhibit C "Pick to Bucket Design Criteria." Further, we support this assertion with our handwritten notes dated April 11, 2000 describing at least the "Pick Arrow Indicator."

14. All statements made herein of our own knowledge are true and all statements made on information and belief are believed to be true; and further these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and such willful false statements may jeopardize the validity of the application or patent issued thereon.

8/29/06
Date

Jimmy Randolph Lewis FCMNC

8/29/06
Date

Sean Gary McGonagle FCMNC

Exhibit A

(19)日本国特許庁（ＪＰ）　(12)公開特許公報(A)　(11)特許出願公開番号
特開2000－118641
(P2000－118641A)
(43)公開日　平成12年４月25日(2000.4.25)

(51)Int.Cl.'	識別記号	FI	テーマコード(参考)
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47/48		47/48	3F022

審査請求　未請求　請求項の数４　ＯＬ　（全５頁）

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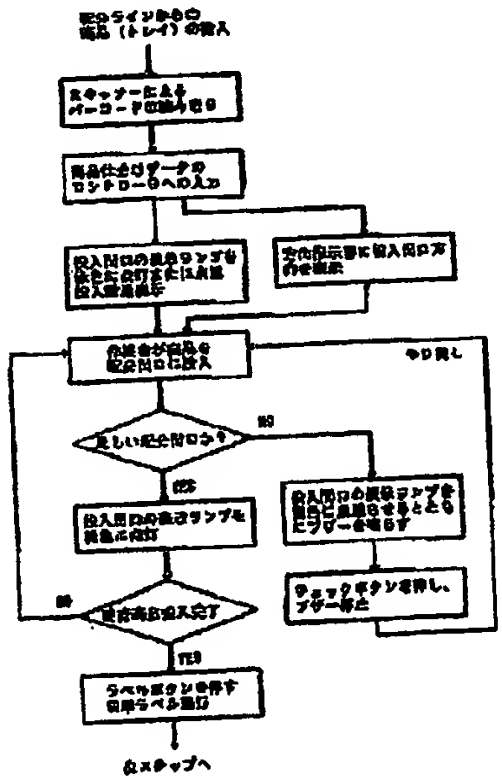
JC18
3F022 AA15 EE01 EE09 FF01 LL32
NN11 NN36 NN49 NN59 NN70
PP05 QQ12

(54)【発明の名称】　商品仕分け装置

(57)【要約】
【課題】　従来の投入表示器を用いた商品仕分け装置に比べ、作業者の負担を軽減するようにして、作業効率を向上させ、商品の誤投入率を低減する。
【解決手段】　搬入されてきた商品のラベルをバーコードスキャナで読み取り、コントローラへ商品仕分けデータを入力する。単一の作業者が担当する仕分けブロックの複数の配分開口のうち、商品を投入すべき配分開口の表示ランプを点灯または点滅させ、さらに商品の投入数量を表示する。表示ランプとは別個に、一つの仕分けブロックに対し一つの方向指示器を設け、コントローラからの制御信号により、商品を投入すべき配分開口の方向を矢印等で表示する。作業者は方向指示器の表示方向に従って投入開口を見付け、表示ランプが点灯または点滅している配分開口に所定の数量の商品を投入する。



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【特許請求の範囲】

【請求項１】　仕分け区分に応じて商品が投入される複数の配分開口を備えた仕分けブロックと、仕分けのために搬入されてくる単一または一群の商品に付与された商品仕分けデータを読み取る読取り手段と、前記読取り手段から入力された商品仕分けデータに基づいて、当該商品を投入すべき配分開口を指示するコントローラとを有する商品仕分け装置において、前記仕分けブロック内に、商品を投入すべき配分開口の方向を表示する方向指示器を設け、前記コントローラによって前記方向指示器の表示方向を制御するよう構成したことを特徴とする商品仕分け装置。

【請求項２】　前記読取り手段は、商品に貼付したラベルに表示された商品仕分けデータを読み取り、前記コントローラに入力するスキャナである請求項１記載の商品仕分け装置。

【請求項３】　前記方向指示器は、所定の仕分けブロックを担当する作業者が搬入されてきた商品を受け取る商品受取り位置近傍に設置されている請求項１または２記載の商品仕分け装置。

【請求項４】　前記方向指示器に加え、各配分開口部分にも搬入されてきた商品の投入位置であることを示す投入表示器が設置されており、前記コントローラからの制御信号により投入表示器のランプを点灯または点滅させるよう構成した請求項１、２または３記載の商品仕分け装置。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本願発明は、仕分けのために搬入されてくる商品を、作業者が仕分け棚等の所定の商品配分開口に投入する際の作業を簡易化するための商品仕分け装置に関するもので、例えば商品配送センターにおける各種仕分け作業等に利用することができる。

【０００２】

【従来の技術】商品配送センターにおける自動化された仕分けシステムの一つとして、納品先や商品の種類に応じて区分した仕分け棚等の配分開口を利用して、商品の仕分けを行う方法がある。

【０００３】その一つの方式としては、例えば、商品納入業者が搬入してきた商品に、商品の種類や個数、納品先等に関する商品仕分けデータを付与し、これをトレイ等に載せた状態で、ベルトコンベア等の搬送装置で仕分けエリアまで搬送し、各仕分けブロックに設置したコントローラに接続したスキャナで商品仕分けデータを読み取り、コントローラの指示により所定の数量の商品を所定の配分開口に投入する作業を繰り返すことで、納品先の注文に応じた仕分けを行うものがある。

【０００４】コントローラによる指示方法としては、各配分開口の上部等に、商品投入位置であることを示す表示ランプや投入すべき商品の個数を表示する個数表示器等を備えた投入表示器を設け、これらをコントローラで制御することが行われている（例えば、特開平８－８５６０９号公報参照）。

【０００５】また、各配分開口には、通常、樹脂製の折畳み式コンテナ等が設置され、コンテナが満杯になった時点あるいは所定量の商品が投入された時点で、納品先に対する明細ラベル等を発行し、コンテナごと再びベルトコンベア等の搬送装置で配送エリアまで搬送し、トラック等に積み込んで、仕向先に納品される。

【０００６】なお、仕分けシステムの制御については、ホストコンピュータと、端末としての各コントローラを接続して制御を行う方式や、コントローラをホストコンピュータとは切り離して、商品納入業者の納品時あるいは納品前に付与される商品仕分けデータに基づいて、仕分け制御を行う方式等がある。

【０００７】

【発明が解決しようとする課題】上述した従来の投入表示器は、複数の配分開口からなる仕分けブロックを担当する作業者が、搬送されてきた商品を投入すべき開口を容易に見つけ出すことができるようにし、それによって作業効率の向上、商品の誤投入の防止を図ったものである。

【０００８】しかしながら、配分開口は作業者の商品受取り位置に対し左右あるいは前後左右にあり、また搬送されてきた商品を投入すべき配分開口が複数ある場合には、通常、複数の配分開口の投入表示器が同時に作動することから、作業者は広い範囲を見渡す必要があり、場合によっては複数の配分開口を同時に判断しなければならない。

【０００９】本願発明は、このような従来の投入表示器を用いた方式における作業者の負担を軽減することにより、作業効率をさらに向上させ、商品の誤投入率を大幅に低減することを目的としたものである。

【００１０】

【課題を解決するための手段】本願の請求項１に係る発明は、仕分け区分に応じて商品が投入される複数の配分開口を備えた仕分けブロックと、仕分けのために搬入されてくる単一または一群の商品に付与された商品仕分けデータを読み取る読取り手段と、前記読取り手段から入力された商品仕分けデータに基づいて、当該商品を投入すべき配分開口を指示するコントローラとを有する商品仕分け装置において、前記仕分けブロック内に、商品を投入すべき配分開口の方向を指示する方向指示器を設け、前記コントローラによって前記方向指示器の指示方向を制御するよう構成したことを特徴とするものである。

【００１１】なお、ここでいう仕分けブロックは、多数の配分開口のうちの一人の作業者が担当する範囲を指すものとする。コントローラは、仕分けシステム全体を制御するホストコンピュータの端末として機能するものに

限らず、仕分けブロックごと単独で制御を行うものであってもよい。

【００１２】方向指示器は、一般的には液晶画面に配分開口の方向を矢印等で表示するものを考えているが、何らかの形で配分開口の方向を指示するものであれば、特に限定されない。

【００１３】請求項２は、請求項１に係る商品仕分け装置において、読取り手段がスキャナの場合であり、スキャナで商品に貼付したラベルに表示された商品仕分けデータを読み取り、コントローラに入力し、コントローラによって仕分け制御が行われる。

【００１４】より具体的には、通常、一群の商品に対し、その商品の種類や個数、納品先（仕向先）、必要に応じ納品業者等のデータをバーコード等の形でラベルに印刷したものをバーコードスキャナ等で読み取り、コントローラに入力する。

【００１５】なお、商品仕分けデータを表示するラベルは、商品に直接貼付される場合の他、商品をトレイあるいはコンテナ等に載せて搬送する場合は、ラベルをトレイあるいはコンテナに貼付する場合もある。

【００１６】請求項３は、請求項１または２に係る商品仕分け装置において、方向指示器が所定の仕分けブロックを担当する作業者の商品受取り位置近傍に設置されている場合である。

【００１７】方向指示器は、基本的には単に次に投入すべき配分開口の方向を指示するものであるため、作業者が投入されてきた商品を受け取る位置近傍に設けるのが、最も効率的である。ただし、配分開口が作業者の前後左右にある場合には一人の作業範囲内に２以上の方向指示器が設置される場合もあり得る。

【００１８】また、仕分け棚の形で、高さ方向に複数段の配分開口がある場合には、仕分け棚の作業範囲中央に鉛直面内で各配分開口方向を指示する方向指示器を設けたり、仕分け棚が作業者の両側にある場合には、両側の仕分け棚間の中央に、鉛直面内で各配分開口方向を指示する方向指示器を設けることも考えられる。

【００１９】請求項４は、請求項１または２に係る商品仕分け装置において、方向指示器に加え、各配分開口部分にも投入されてきた商品の投入位置であることを示す投入表示器が設置されており、コントローラからの制御信号により投入表示器のランプを点灯または点滅させるよう構成した場合である。

【００２０】上述のように、方向指示器は、基本的には次に投入すべき配分開口の方向を指示するものであり、従来の表示ランプや個数表示器等を備えた投入表示器と併用することで、作業効率を上げることができる。

【００２１】ただし、本願発明において投入表示器は必須ではなく、例えば方向指示器に配分開口に関する指示が同時に表示されるものや、配分開口に開閉式の扉が設け、コントローラによって投入すべき開口の開閉を制御

するもの等と併用することも可能である。

【００２２】

【発明の実施の形態】次に、本願発明の好ましい一実施形態を図面に基づいて説明する。図２は仕分けエリアに設置され、商品仕分け装置を構成する仕分け棚１部分の一例を示したものである。この例では上下２段の仕分け棚１の下段に１２個、上段に１１個の樹脂製の折畳み式コンテナ３が設置され、合計２３の配分開口２を形成している。

【００２３】このうち、中央より左側の１２個の配分開口２が、１人目の作業者の受け持つ仕分けブロックを構成し、中央下段を含む右側の１１個の配分開口２が２人目の作業者の受け持つ仕分けブロックを構成し、搬送されてくる一群の商品を２人の作業者でリレー式に取り扱うシステムとなっている。

【００２４】下段には、さらに固定式のバーコードスキャナ６が取り付けられており、図３のイメージ図のように、配分ラインからベルトコンベア４によって搬送されてくる一群の商品５の商品仕分けデータを読み取る。

【００２５】なお、この例では、１種類複数の商品がトレイ等に載せられてベルトコンベア４によって搬送され、バーコードスキャナ６でトレイに貼付したラベルに印刷されている商品仕分けデータを読み取り、商品の個数、納品先に応じた配分開口等が、上段中央部のコントローラ７に入力される。

【００２６】また、各配分開口２の上部または下部には、それぞれ図５に示すような投入表示器９が設けられ、コントローラ７からの制御信号により投入表示器９の表示ランプ１０および個数表示器１２を制御することで、商品を投入すべき配分開口２およびその配分開口２に投入すべき商品の個数が表示される。

【００２７】図５は、その表示状態を示したもので、表示ランプ１０が赤色に点灯し、また個数表示器１２が個数（この例では６個）を表示している。なお、通常は、１つのトレイに複数の商品が載せられた状態で搬送されてくる。従って、同時に搬送されてきた商品を複数の配分開口２に投入する場合には、複数の配分開口２の表示ランプが赤色に点灯し、順次、赤色が点滅することで、作業者に投入順を知らせるようになっている。

【００２８】さらに、左右それぞれの仕分けブロックについて、仕分け棚１の中段に方向指示器８が取り付けられており、コントローラ７で指示された配分開口２の方向を矢印で表示するようになっている。この方向指示器８の制御は、投入表示器９の表示ランプ１０の制御と連動させて行うことができる。

【００２９】また、仕分け棚１の各配分開口２の両側には、それぞれ１対の透過形赤外線センサ１４が設けられており、コンテナ３に商品を投入する際、商品および作業者の手が通過するのを検知するようになっている。

【００３０】検知信号は、コントローラ７に入力され、

商品投入位置が正しい場合には、コントローラ７より、図６に示すように表示ランプ１０を緑色に点灯させるための制御信号が発せられる。

【００３１】もし、商品投入位置が誤っている場合には、コントローラ７から制御信号が発せられ、図７に示すように表示ランプ１０が黄色に点滅すると同時に、コントローラ７によって制御されるブザー（図示せず）が警報音を発するようになっている。その場合、作業者は表示ランプ１０の脇にあるチェックボタン１１を押すことで、表示ランプ１０の点滅およびブザーを止め、正しい配分間口に商品を投入し直すことになる。

【００３２】図１はこの一連の流れをフロー図として示したもので、作業者が担当する仕分けブロックへの商品投入が完了したら、投入表示器９の右端に設けたラベル発行ボタン１３を押し、納品先へ添付される明細ラベルをコントローラ７の下に位置するラベル発行機１５から発行する。ただし、この明細ラベルの発行は、その配分間口２にあるコンテナ３に仕分けされる全商品が投入された後に行われ、全商品の投入が完了するまでは、次に搬送されて来る商品の仕分け作業が繰り返される。

【００３３】

【発明の効果】本願発明の商品仕分け装置は、従来の投入表示器が個々の配分間口ごとに設けられ、視覚による全体の把握が困難であったのに対し、仕分けブロックの１箇所に設けた方向指示器が商品を投入すべき配分間口の方向を指示するため、仕分けブロック全体を見渡さなくとも直ちに配分間口への商品投入操作を行うことがで＊

＊き、作業効率が向上する。

【００３４】また、作業者の負担が軽減されることで、商品の誤投入率も大幅に低減することができる。

【図面の簡単な説明】

【図１】本願発明の一実施形態における商品仕分け装置による作業のフロー図である。

【図２】本願発明に係る商品仕分け装置の仕分け棚部分の正面図である。

【図３】商品仕分け装置位置への商品の搬入の様子を示す概念図である。

【図４】仕分けブロックごとに設置される方向指示器の表示形式の一例を示す図である。

【図５】配分間口ごとに設置される投入表示器が、投入間口位置および投入個数の表示している状態を示す正面図である。

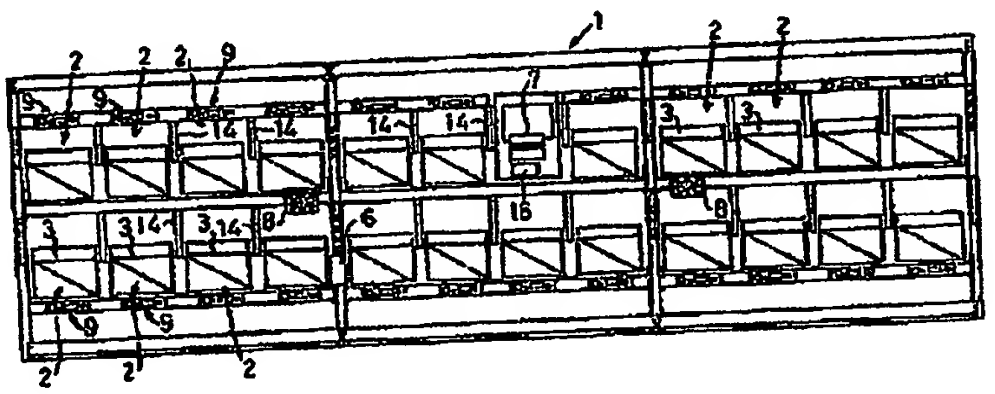
【図６】商品の投入が正しく行われた場合の表示状態を示す投入表示器の正面図である。

【図７】商品が誤投入された場合の表示状態を示す投入表示器の正面図である。

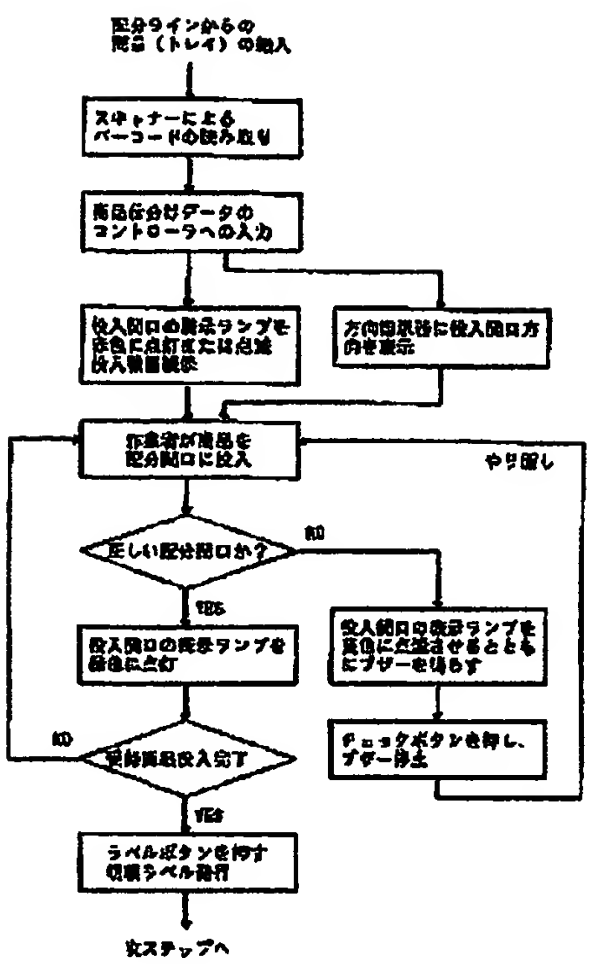
【符号の説明】

１…仕分け棚、２…配分間口、３…コンテナ、４…ベルトコンベア、５…商品、６…バーコードスキャナ、７…コントローラ、８…方向指示器、９…投入表示器、１０…表示ランプ、１１…チェックボタン、１２…個数表示器、１３…明細ラベル発行ボタン、１４…透過形赤外線センサ、１５…ラベル発行機

【図２】



【図1】



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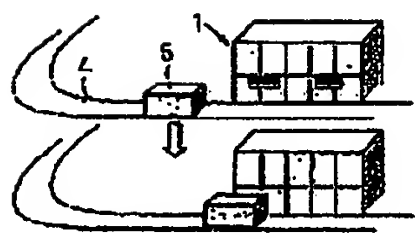
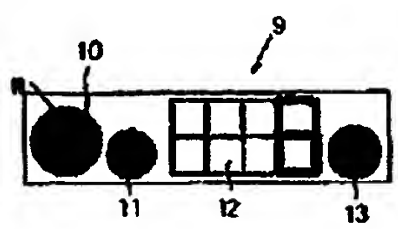
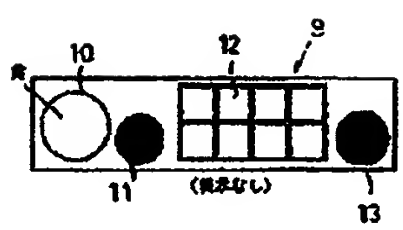


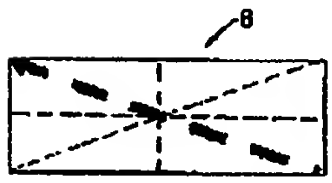
【図6】



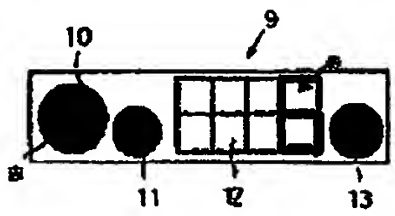
【図7】



【図4】



【図5】



PATENT ABSTRACTS OF JAPAN

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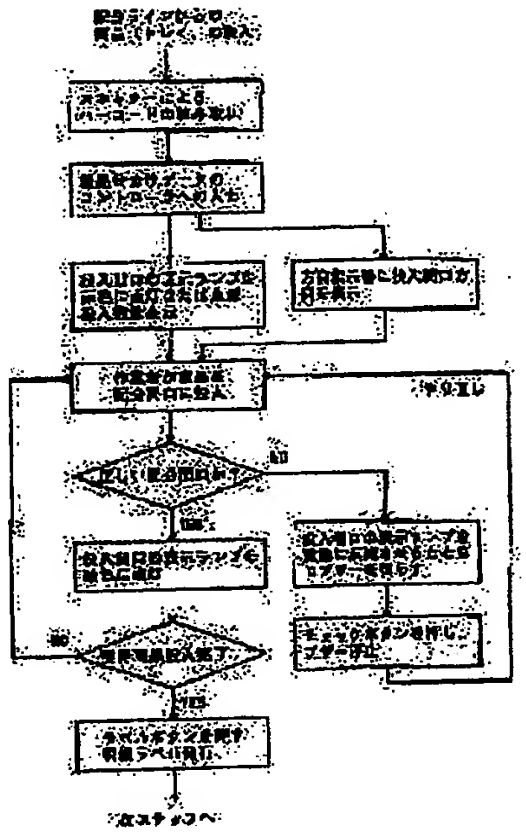
(71)Applicant : AT & C:KK
(72)Inventor : TAKIZAWA CHIYUKI

(54) GOODS SORTING DEVICE

(57)Abstract:
PROBLEM TO BE SOLVED: To improve working efficiency and to reduce erroneous inputting rate of goods by reducing burden of a worker in comparison with a goods sorting device using a conventional input indicator.
SOLUTION: A label of deposited goods is read by a bar code scanner, and a goods sorting data is input to a controller. Input quantity of goods is indicated by putting on or flashing an indication lamp of a distribution frontage to input the goods out of a plural number of the distribution frontages of a classification block which a single worker is in charge of. Separately from the indication lamp, one direction indicator is provided for the one classification block, and a direction of the distribution frontage to input the goods to is indicated by an arrow, etc., by a control signal from the controller. The worker finds an input frontage in accordance with an indication direction of the direction indicator and inputs specified quantity of the goods in the distribution frontage on which the indication lamp is put on or flashes.



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[Date of extinction of right]	

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CLAIMS

[Claim(s)]
[Claim 1] The classification block equipped with two or more allocation frontages into which goods are thrown according to a classification partition, the single carried in for classification, or a group -- with a read means to read the goods classification data given to goods In the goods assortment equipment which has the controller which directs the allocation frontage which should throw in the goods concerned based on the goods classification data inputted from said read means Goods assortment equipment characterized by constituting so that the turn signal which displays the direction of the allocation frontage which should throw in goods may be formed in said classification block and the display direction of said turn signal may be controlled by said controller.
[Claim 2] Said read means is goods assortment equipment according to claim 1 which is the scanner which reads the goods classification data displayed on the label stuck on goods, and is inputted into said controller.
[Claim 3] Said turn signal is goods assortment equipment according to claim 1 or 2 currently installed near the goods receipt location which receives the goods with which the operator who takes charge of a predetermined classification block has been carried in.
[Claim 4] Goods assortment equipment according to claim 1, 2, or 3 constituted so that the injection drop which shows that it is the injection location of the goods carried in also to each allocation frontage part might be installed in addition to said turn signal and the lamp of an injection drop might be turned on or blinked with the control signal from said controller.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] The invention in this application is applicable to various classification activities [in / a goods delivery center] etc. about the goods assortment equipment for simplifying the activity at the time of an operator throwing the goods carried in for classification into predetermined goods allocation frontages, such as a classification shelf.
[0002]
[Description of the Prior Art] There is the approach of classifying goods using allocation frontages, such as a classification shelf classified according to the class of a delivery-of-goods place or goods as one of the automated classification systems in a goods delivery center.
[0003] It is in the condition which gave the goods classification data about the class of goods, the number, a delivery-of-goods place, etc. to the goods which the goods delivery contractor has carried in, and put this on the tray etc. as the one method, for example. Convey to classification area by transport devices, such as a band conveyor, and goods classification data are read with the scanner linked to the controller installed in each classification block. There are some which perform classification according to the order of a delivery-of-goods place by repeating the activity which throws the goods of predetermined quantity into a predetermined allocation frontage with directions of a controller.
[0004] As the directions approach by the controller, the injection drop equipped with the number drop which displays the number of the display lamp in which it is shown that it is a goods injection location, or the goods which should be thrown in is formed in the upper part of each allocation frontage etc., and controlling these by the controller is performed (for example, refer to JP,8-85609,A).
[0005] Moreover, a detail [as opposed to / when the goods of the time of the folding type container of the product made of resin usually etc. being installed in each allocation frontage and a container filling or the specified quantity were thrown in / a delivery-of-goods place] label etc. is published, and it conveys to delivery area by transport devices, such as a band conveyor, again the whole container, it loads into a truck etc., and a destination is delivered.
[0006] In addition, about control of a classification system, there are a method which controls by connecting each controller as a terminal with a host computer, a method which performs classification control based on the goods classification data which a host computer separates a controller and are given before the time of a goods delivery contractor's delivery of goods or delivery of goods.
[0007]
[Problem(s) to be Solved by the Invention] The operator who takes charge of the classification block which consists of two or more allocation frontages enables it to find out the frontage which should throw in the conveyed goods easily, and the conventional injection indicator mentioned above aims at improvement in working efficiency, and prevention of an incorrect injection of goods by it.
[0008] However, when there are two or more allocation frontages which an allocation frontage has in

right and left or front and rear, right and left to an operator's goods receipt location, and should throw in the conveyed goods, since the injection drop of two or more allocation frontages operates to coincidence, an operator needs to overlook the large range and usually has to judge two or more allocation frontages to coincidence depending on the case.

[0009] By mitigating an operator's burden in the method which used such a conventional injection drop, the invention in this application raises working efficiency further, and aims at reducing the rate of an incorrect injection of goods sharply.

[0010]

[Means for Solving the Problem] The classification block whose invention concerning claim 1 of this application was equipped with two or more allocation frontages into which goods are thrown according to a classification partition, the single carried in for classification, or a group -- with a read means to read the goods classification data given to goods In the goods assortment equipment which has the controller which directs the allocation frontage which should throw in the goods concerned based on the goods classification data inputted from said read means In said classification block, the turn signal which shows the direction of the allocation frontage which should throw in goods is formed, and it is characterized by constituting so that the directions direction of said turn signal may be controlled by said controller.

[0011] In addition, a classification block here shall point out the range which one operator in many allocation frontages takes charge of. A controller may control independently what [not only] functions as a terminal of the host computer which controls the whole classification system but the whole classification block.

[0012] Generally, although what displays the direction of an allocation frontage on a liquid crystal screen by an arrow head etc. is considered, a turn signal will not be especially limited, if the direction of an allocation frontage is shown in a certain form.

[0013] In the goods assortment equipment which claim 2 requires for claim 1, it is the case where a read means is a scanner, and the goods classification data displayed on the label stuck on goods with the scanner are read, it inputs into a controller, and classification control is performed by the controller.

[0014] more -- concrete -- usually -- a group -- what printed data, such as a delivery-of-goods contractor, on the label in forms, such as a bar code, the class of the goods, the number, a delivery-of-goods place (destination), and if needed is read with a bar code scanner etc. to goods, and it inputs into a controller.

[0015] In addition, the label which displays goods classification data may stick a label on a tray or a container, when putting goods besides in the case of being directly stuck on goods on a tray or a container and conveying them.

[0016] Claim 3 is the case where the turn signal is installed near the goods receipt location of the operator who takes charge of a predetermined classification block, in the goods assortment equipment concerning claims 1 or 2.

[0017] Since a turn signal is what shows the direction of the allocation frontage which should only be supplied to a degree, it is fundamentally most efficient to prepare near the location which receives the goods with which the operator has been carried in. However, when an allocation frontage is in an operator's front and rear, right and left, two or more turn signals may be installed in one person's activity within the limits.

[0018] Moreover, when the turn signal which shows each allocation frontage direction within a vertical plane is formed in the center of the activity range of a classification shelf in the form of a classification shelf when there are two or more steps of allocation frontages in the height direction, or a classification shelf is in an operator's both sides, forming the turn signal which shows each allocation frontage direction within a vertical plane in the center between the classification shelves of both sides is also considered.

[0019] In the goods assortment equipment concerning claims 1 or 2, in addition to the turn signal, the

injection drop which shows that it is the injection location of the goods carried in also to each allocation frontage part is installed, and claim 4 is the case where it constitutes so that the lamp of an injection drop may be turned on or blinked with the control signal from a controller.
[0020] As mentioned above, fundamentally, a turn signal shows the direction of the allocation frontage which should be supplied to a degree, and can raise working efficiency by using together with the injection drop equipped with a conventional display lamp, a conventional number drop, etc.
[0021] However, in the invention in this application, an injection drop is not indispensable, for example, it is also possible to use together with what the directions about an allocation frontage are displayed on a turn signal as by coincidence, the thing which controls closing motion of the frontage which the door of a closing motion type should prepare in an allocation frontage, and should be supplied by the controller.
[0022]
[Embodiment of the Invention] Next, 1 desirable operation gestalt of the invention in this application is explained based on a drawing. Drawing 2 is installed in classification area and shows an example of classification shelf 1 part which constitutes goods assortment equipment. In this example, 11 fold-up formula containers 3 made of resin are installed in 12 pieces and an upper case by the lower berth of the classification shelf 1 of two steps of upper and lower sides, and allocation frontage 2 of a total of 23 is formed.
[0023] among these, a group which the allocation frontage 2 of 12 pieces on the left of a center constitutes the classification block which the 1st operator takes charge of, and the allocation frontage 2 of 11 pieces of the right-hand side containing the central lower berth constitutes the classification block which the 2nd operator takes charge of, and is conveyed -- it is the system which deals with goods at a relay ceremony by two operators.
[0024] a group which the fixed bar code scanner 6 is further attached in the lower berth, and is conveyed on a band conveyor 4 from allocation Rhine as shown in the image Fig. of drawing 3 -- the goods classification data of goods 5 are read.
[0025] In addition, in this example, the goods of one-kind plurality are put on a tray etc., it is conveyed on a band conveyor 4, the goods classification data currently printed by the label stuck on the tray with the bar code scanner 6 are read, and the allocation frontage according to the number of goods and a delivery-of-goods place etc. is inputted into the controller 7 of an upper case center section.
[0026] Moreover, the injection drop 9 as shown in drawing 5 , respectively is formed in the upper part or the lower part of each allocation frontage 2, and the number of the goods which should be thrown into the allocation frontage 2 which should throw in goods, and its allocation frontage 2 by controlling the display lamp 10 of the injection drop 9 and the number drop 12 by the control signal from a controller 7 is displayed on it.
[0027] Drawing 5 is what showed that display condition, a display lamp 10 lights up in red, and the number drop 12 shows the number (this example six pieces). In addition, where two or more goods are put on one tray, it is usually conveyed. Therefore, in throwing into two or more allocation frontages 2 the goods conveyed by coincidence, the display lamp of two or more allocation frontages 2 lights up in red, and it tells an operator about the order of an injection one by one because red blinks.
[0028] Furthermore, the turn signal 8 is attached in the middle of the classification shelf 1 about the classification block of each right and left, and the direction of the allocation frontage 2 directed by the controller 7 is expressed as an arrow head. Control of this turn signal 8 can be performed by making it control of the display lamp 10 of the injection drop 9 interlocked with.
[0029] Moreover, in case one pair of transparency form infrared sensors 14 are formed in the both sides of each allocation frontage 2 of the classification shelf 1, respectively and goods are fed into a container 3, it detects that the hand of goods and an operator passes.
[0030] A detection signal is inputted into a controller 7 and a control signal for a goods injection location to make a right case turning on a display lamp 10 green from a controller 7, as shown at

drawing 6 is emitted.

[0031] When the goods injection location is mistaken, a control signal is emitted from a controller 7, and the buzzer (not shown) controlled by the controller 7 emits an alarm tone at the same time a pilot light 10 blinks in yellow, as shown in drawing 7 . In that case, an operator is pushing the check carbon button 11 in the side of a pilot light 10, and will rethrow goods into a stop and a right allocation frontage for flashing and the buzzer of a pilot light 10.

[0032] Drawing 1 is what showed this flow of a series of as a flow Fig., and if the goods injection to the classification block which an operator takes charge of is completed, it will publish the detail label attached at push and a delivery-of-goods place in the label issue carbon button 13 prepared in the right end of the injection indicator 9 from the label issue machine 15 located under a controller 7. However, the classification activity of the goods conveyed next is repeated until issue of this detail label is performed after all the commodity classified by the container 3 in that allocation frontage 2 are supplied, and the injection of all the commodity is completed.

[0033]

[Effect of the Invention] In order that the goods assortment equipment of the invention in this application may show the direction of an allocation frontage where the turn signal which the conventional injection drop was formed for each allocation frontage of every, and was formed in one place of a classification block to grasp of the whole by vision having been difficult for should throw in goods, even if it does not overlook the whole classification block, it can perform goods closing operation to an allocation frontage immediately, and its working efficiency improves.

[0034] Moreover, the rate of an incorrect injection of goods can also be sharply reduced by an operator's burden being mitigated.

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TECHNICAL FIELD

[Field of the Invention] The invention in this application is applicable to various classification activities [in / a goods delivery center] etc. about the goods assortment equipment for simplifying the activity at the time of an operator throwing the goods carried in for classification into predetermined goods allocation frontages, such as a classification shelf.

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PRIOR ART

[Description of the Prior Art] There is the approach of classifying goods using allocation frontages, such as a classification shelf classified according to the class of a delivery-of-goods place or goods as one of the automated classification systems in a goods delivery center.

[0003] It is in the condition which gave the goods classification data about the class of goods, the number, a delivery-of-goods place, etc. to the goods which the goods delivery contractor has carried in, and put this on the tray etc. as the one method, for example. Convey to classification area by transport devices, such as a band conveyor, and goods classification data are read with the scanner linked to the controller installed in each classification block. There are some which perform classification according to the order of a delivery-of-goods place by repeating the activity which throws the goods of predetermined quantity into a predetermined allocation frontage with directions of a controller.

[0004] As the directions approach by the controller, the injection drop equipped with the number drop which displays the number of the display lamp in which it is shown that it is a goods injection location, or the goods which should be thrown in is formed in the upper part of each allocation frontage etc., and controlling these by the controller is performed (for example, refer to JP,8-85609,A).

[0005] Moreover, a detail [as opposed to / when the goods of the time of the folding type container of the product made of resin usually etc. being installed in each allocation frontage and a container filling or the specified quantity were thrown in / a delivery-of-goods place] label etc. is published, and it conveys to delivery area by transport devices, such as a band conveyor, again the whole container, it loads into a truck etc., and a destination is delivered.

[0006] In addition, about control of a classification system, there are a method which controls by connecting each controller as a terminal with a host computer, a method which performs classification control based on the goods classification data which a host computer separates a controller and are given before the time of a goods delivery contractor's delivery of goods or delivery of goods.

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EFFECT OF THE INVENTION

[Effect of the Invention] In order that the goods assortment equipment of the invention in this application may show the direction of an allocation frontage where the turn signal which the conventional injection drop was formed for each allocation frontage of every, and was formed in one place of a classification block to grasp of the whole by vision having been difficult for should throw in goods, even if it does not overlook the whole classification block, it can perform goods closing operation to an allocation frontage immediately, and its working efficiency improves.
[0034] Moreover, the rate of an incorrect injection of goods can also be sharply reduced by an operator's burden being mitigated.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] The operator who takes charge of the classification block which consists of two or more allocation frontages enables it to find out the frontage which should throw in the conveyed goods easily, and the conventional injection indicator mentioned above aims at improvement in working efficiency, and prevention of an incorrect injection of goods by it.

[0008] However, when there are two or more allocation frontages which an allocation frontage has in right and left or front and rear, right and left to an operator's goods receipt location, and should throw in the conveyed goods, since the injection drop of two or more allocation frontages operates to coincidence, an operator needs to overlook the large range and usually has to judge two or more allocation frontages to coincidence depending on the case.

[0009] By mitigating an operator's burden in the method which used such a conventional injection drop, the invention in this application raises working efficiency further, and aims at reducing the rate of an incorrect injection of goods sharply.

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MEANS

[Means for Solving the Problem] The classification block whose invention concerning claim 1 of this application was equipped with two or more allocation frontages into which goods are thrown according to a classification partition, the single carried in for classification, or a group -- with a read means to read the goods classification data given to goods In the goods assortment equipment which has the controller which directs the allocation frontage which should throw in the goods concerned based on the goods classification data inputted from said read means In said classification block, the turn signal which shows the direction of the allocation frontage which should throw in goods is formed, and it is characterized by constituting so that the directions direction of said turn signal may be controlled by said controller.

[0011] In addition, a classification block here shall point out the range which one operator in many allocation frontages takes charge of. A controller may control independently what [not only] functions as a terminal of the host computer which controls the whole classification system but the whole classification block.

[0012] Generally, although what displays the direction of an allocation frontage on a liquid crystal screen by an arrow head etc. is considered, a turn signal will not be especially limited, if the direction of an allocation frontage is shown in a certain form.

[0013] In the goods assortment equipment which claim 2 requires for claim 1, it is the case where a read means is a scanner, and the goods classification data displayed on the label stuck on goods with the scanner are read, it inputs into a controller, and classification control is performed by the controller.

[0014] more -- concrete -- usually -- a group -- what printed data, such as a delivery-of-goods contractor, on the label in forms, such as a bar code, the class of the goods, the number, a delivery-of-goods place (destination), and if needed is read with a bar code scanner etc. to goods, and it inputs into a controller.

[0015] In addition, the label which displays goods classification data may stick a label on a tray or a container, when putting goods besides in the case of being directly stuck on goods on a tray or a container and conveying them.

[0016] Claim 3 is the case where the turn signal is installed near the goods receipt location of the operator who takes charge of a predetermined classification block, in the goods assortment equipment concerning claims 1 or 2.

[0017] Since a turn signal is what shows the direction of the allocation frontage which should only be supplied to a degree, it is fundamentally most efficient to prepare near the location which receives the goods with which the operator has been carried in. However, when an allocation frontage is in an operator's front and rear, right and left, two or more turn signals may be installed in one person's activity within the limits.

[0018] Moreover, when the turn signal which shows each allocation frontage direction within a vertical plane is formed in the center of the activity range of a classification shelf in the form of a classification shelf when there are two or more steps of allocation frontages in the height direction, or a classification

shelf is in an operator's both sides, forming the turn signal which shows each allocation frontage direction within a vertical plane in the center between the classification shelves of both sides is also considered.

[0019] In the goods assortment equipment concerning claims 1 or 2, in addition to the turn signal, the injection drop which shows that it is the injection location of the goods carried in also to each allocation frontage part is installed, and claim 4 is the case where it constitutes so that the lamp of an injection drop may be turned on or blinked with the control signal from a controller.

[0020] As mentioned above, fundamentally, a turn signal shows the direction of the allocation frontage which should be supplied to a degree, and can raise working efficiency by using together with the injection drop equipped with a conventional display lamp, a conventional number drop, etc.

[0021] However, in the invention in this application, an injection drop is not indispensable, for example, it is also possible to use together with what the directions about an allocation frontage are displayed on a turn signal as by coincidence, the thing which controls closing motion of the frontage which the door of a closing motion type should prepare in an allocation frontage, and should be supplied by the controller.

[0022]

[Embodiment of the Invention] Next, 1 desirable operation gestalt of the invention in this application is explained based on a drawing. Drawing 2 is installed in classification area and shows an example of classification shelf 1 part which constitutes goods assortment equipment. In this example, 11 fold-up formula containers 3 made of resin are installed in 12 pieces and an upper case by the lower berth of the classification shelf 1 of two steps of upper and lower sides, and allocation frontage 2 of a total of 23 is formed.

[0023] among these, a group which the allocation frontage 2 of 12 pieces on the left of a center constitutes the classification block which the 1st operator takes charge of, and the allocation frontage 2 of 11 pieces of the right-hand side containing the central lower berth constitutes the classification block which the 2nd operator takes charge of, and is conveyed -- it is the system which deals with goods at a relay ceremony by two operators.

[0024] a group which the fixed bar code scanner 6 is further attached in the lower berth, and is conveyed on a band conveyor 4 from allocation Rhine as shown in the image Fig. of drawing 3 -- the goods classification data of goods 5 are read.

[0025] In addition, in this example, the goods of one-kind plurality are put on a tray etc., it is conveyed on a band conveyor 4, the goods classification data currently printed by the label stuck on the tray with the bar code scanner 6 are read, and the allocation frontage according to the number of goods and a delivery-of-goods place etc. is inputted into the controller 7 of an upper case center section.

[0026] Moreover, the injection drop 9 as shown in drawing 5 , respectively is formed in the upper part or the lower part of each allocation frontage 2, and the number of the goods which should be thrown into the allocation frontage 2 which should throw in goods, and its allocation frontage 2 by controlling the display lamp 10 of the injection drop 9 and the number drop 12 by the control signal from a controller 7 is displayed on it.

[0027] Drawing 5 is what showed that display condition, a display lamp 10 lights up in red, and the number drop 12 shows the number (this example six pieces). In addition, where two or more goods are put on one tray, it is usually conveyed. Therefore, in throwing into two or more allocation frontages 2 the goods conveyed by coincidence, the display lamp of two or more allocation frontages 2 lights up in red, and it tells an operator about the order of an injection one by one because red blinks.

[0028] Furthermore, the turn signal 8 is attached in the middle of the classification shelf 1 about the classification block of each right and left, and the direction of the allocation frontage 2 directed by the controller 7 is expressed as an arrow head. Control of this turn signal 8 can be performed by making it control of the display lamp 10 of the injection drop 9 interlocked with.

[0029] Moreover, in case one pair of transparency form infrared sensors 14 are formed in the both sides

of each allocation frontage 2 of the classification shelf 1, respectively and goods are fed into a container 3, it detects that the hand of goods and an operator passes.

[0030] A detection signal is inputted into a controller 7 and a control signal for a goods injection location to make a right case turning on a display lamp 10 green from a controller 7, as shown at drawing 6 is emitted.

[0031] When the goods injection location is mistaken, a control signal is emitted from a controller 7, and the buzzer (not shown) controlled by the controller 7 emits an alarm tone at the same time a pilot light 10 blinks in yellow, as shown in drawing 7 . In that case, an operator is pushing the check carbon button 11 in the side of a pilot light 10, and will rethrow goods into a stop and a right allocation frontage for flashing and the buzzer of a pilot light 10.

[0032] Drawing 1 is what showed this flow of a series of as a flow Fig., and if the goods injection to the classification block which an operator takes charge of is completed, it will publish the detail label attached at push and a delivery-of-goods place in the label issue carbon button 13 prepared in the right end of the injection indicator 9 from the label issue machine 15 located under a controller 7. However, the classification activity of the goods conveyed next is repeated until issue of this detail label is performed after all the commodity classified by the container 3 in that allocation frontage 2 are supplied, and the injection of all the commodity is completed.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the flow Fig. of the activity by the goods assortment equipment in 1 operation gestalt of the invention in this application.

[Drawing 2] It is the front view for a classification shelf of the goods assortment equipment concerning the invention in this application.

[Drawing 3] It is the conceptual diagram showing the situation of carrying in of the goods to a goods assortment equipment location.

[Drawing 4] It is drawing showing an example of the display format of the turn signal installed for every classification block.

[Drawing 5] The injection drop installed for every allocation frontage is the front view showing the condition of displaying an injection frontage location and the injection number.

[Drawing 6] It is the front view of an injection drop showing a display condition when an injection of goods is performed correctly.

[Drawing 7] It is the front view of an injection drop showing a display condition when goods are incorrect-thrown in.

[Description of Notations]

1 [-- A band conveyor, 5 / -- Goods, 6 / -- A bar code scanner, 7 / -- A controller, 8 / -- A turn signal, 9 / -- An injection indicator, 10 / -- A pilot light, 11 / -- A check carbon button, 12 / -- A number indicator, 13 / -- A detail label issue carbon button 14 / -- A transparency form infrared sensor, 15 / -- Label issue machine] -- A classification shelf, 2 -- An allocation frontage, 3 -- A container, 4

[Translation done.]

REDACTED

FLOW RACK & SHELVING

- Might have to repl. 2 locations per day
- might " " pick from 2 locations per day

SHELVING

48 items in 45 SQ FT 0.9 SQ FT / ITEM

FLOW RACK

35 items in 48 SQ FT 1.4 SQ FT / ITEM

- more item facings per SQ. FT.
- have to repl. every day

ORLANDO

70,000 lines x 5.8 pc/line = 406,000 ÷ 38 PC = 10,684 cs/day

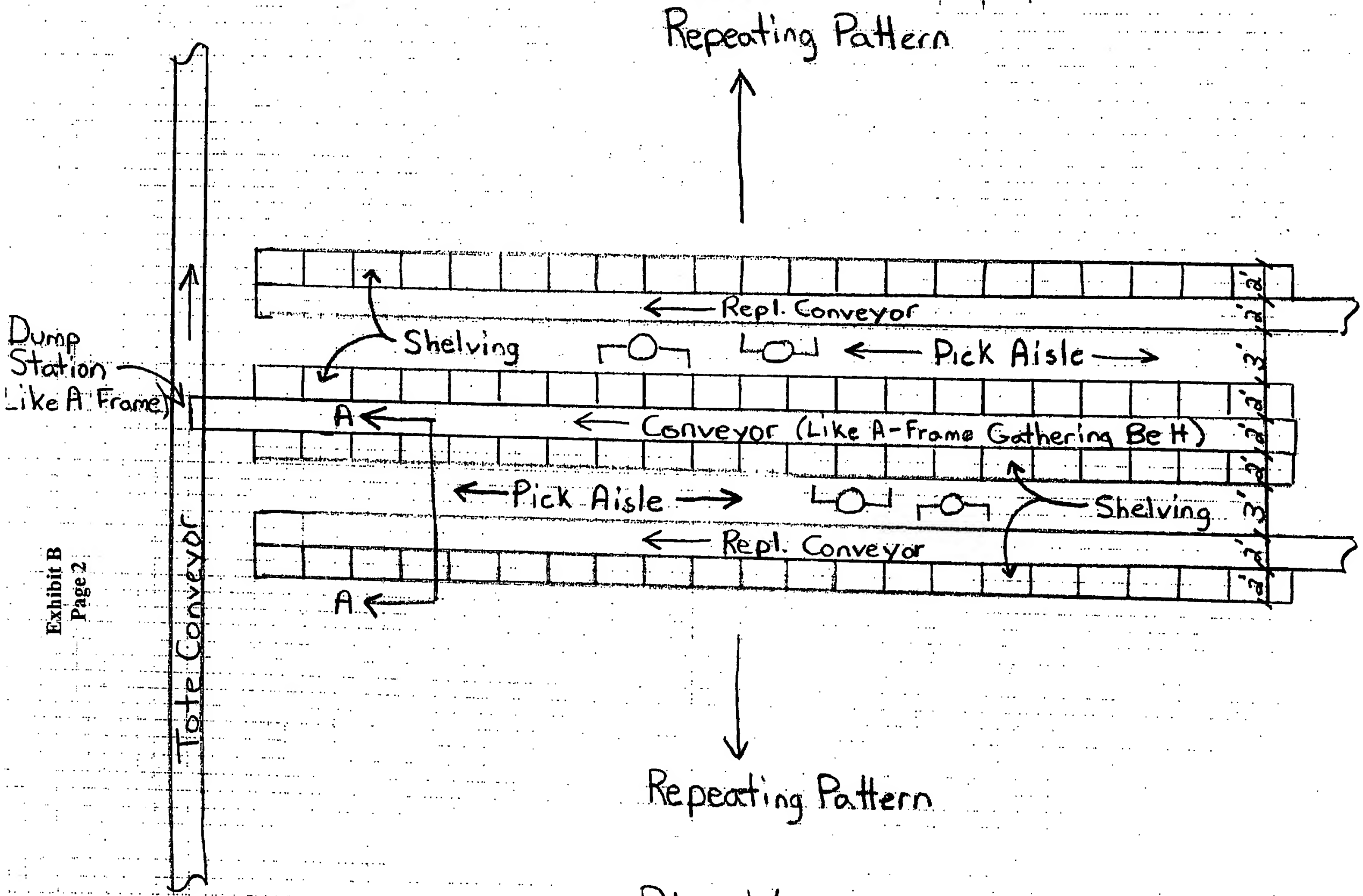
ITEMS

- For repl pick every item thats billed
  w/ Orderpicker more up & down (steps) in an aisle
  W&P more more steps
- Repl more steps when picking
- all Repl. is an "E" - have to get all repl. picked & stocked before start of picking
- every item has less a shelving location
- multi cases ~~in~~ shelving
- Productivity rate will go down for repl picking
- Stocking rate will go down - have to make more steps
- Have WFI price for different lengths of shelving

PICKING

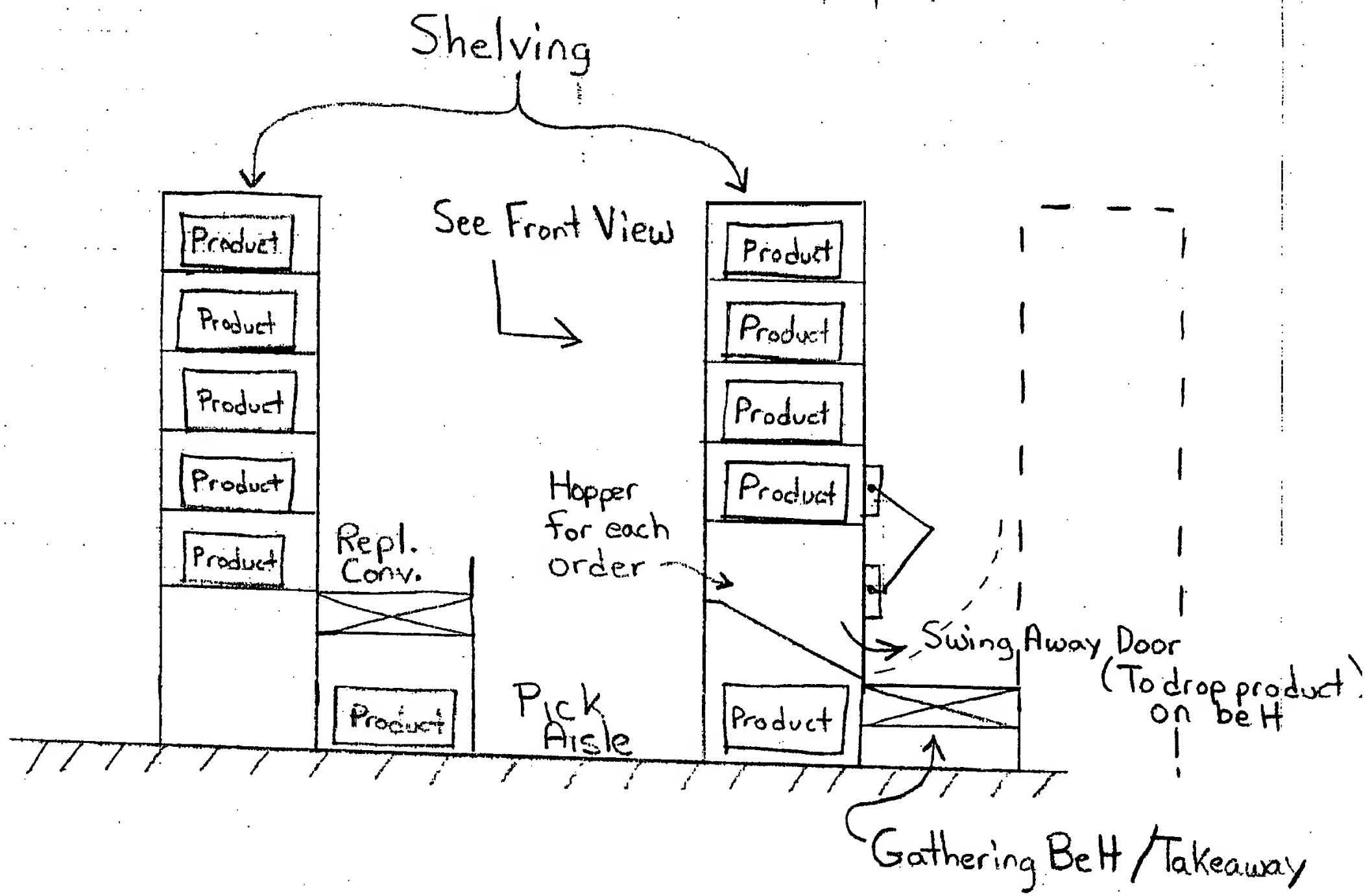
- have to turn around w/ HAF - lower productivity
- less flexability. pickers can't pick ahead of each other
- Bins can't drop till all picks for that order done
- If item won't fit b/c of cube problems - have to short store

Human A-Frame



Plan View

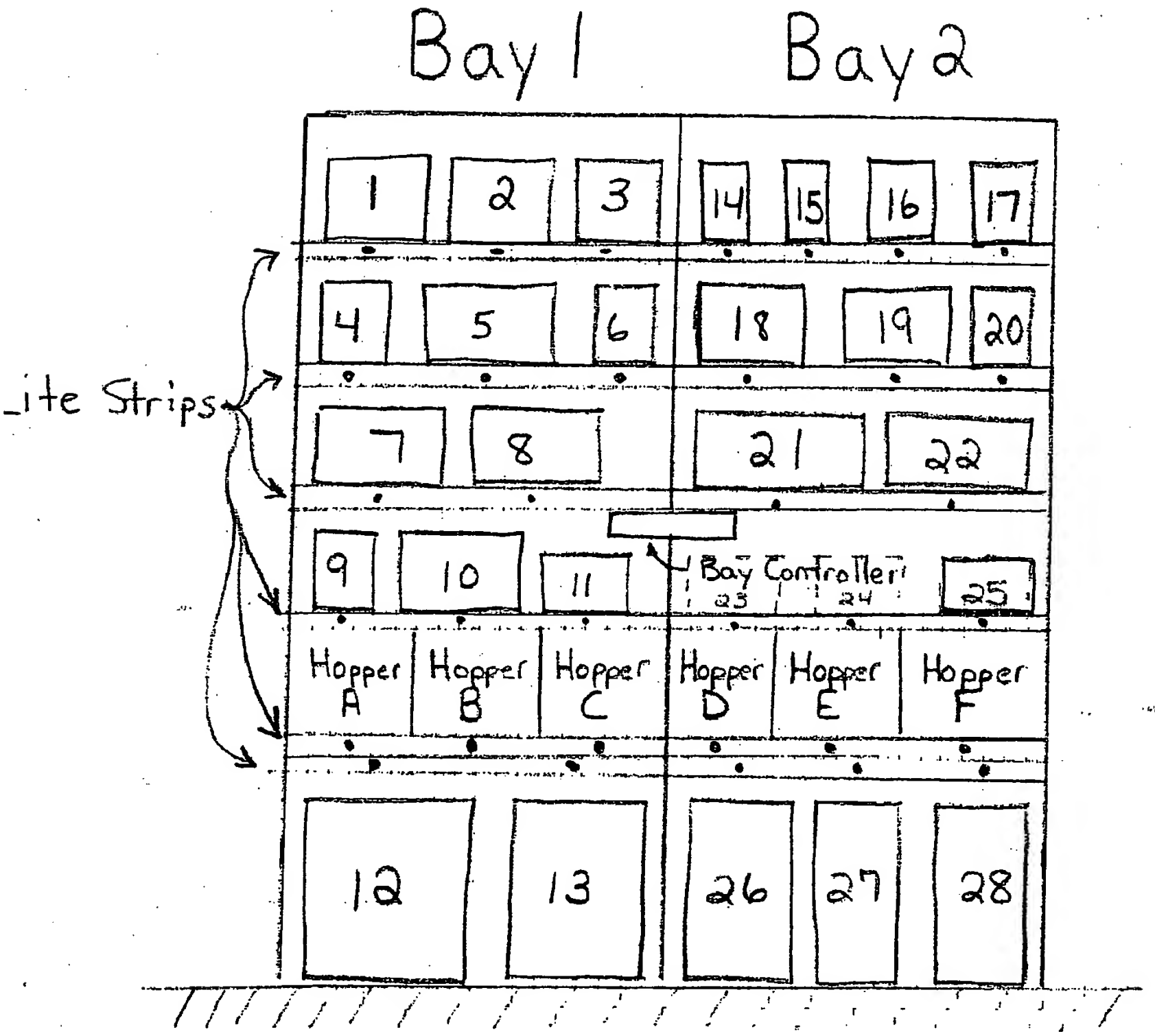
Human H-frame



View A-A

Human A-Frame

Exhibit B
Page 4



Front View

REDACTED

HUMAN A-FRAME

- Kennedy Electric Toronto — Internet Response to A-Frame

CONTACT CO.'s get breakdown on costs

Pass along 250 L/H (Passing Time / Picking Time)

Human A-Frame = (Picking Time Rate)

Assumed pick - 4 orders at a time

Pick To Bucket Design Criteria

The following criteria are to be used to establish budget pricing for Walgreen's "Pick to Bucket" picking machine.

General Description

The "Pick To Bucket" (PTB) picking machine consists of a series of pick buckets or hoppers that are positioned above a collection or gathering belt. This belt will run in the center of two aisles of flow rack. Split case Pickers will pick product from the flow rack and be directed via Walgreens supplied Pick To Light System to put the product into a hopper indicated by a light that contains the picks for that order in that bay. When all the picks for an order in the entire aisle are complete the hoppers will drop the product onto the collection belt. The collection belt would then dump the product into a shipping tote at the end of aisle dump station.

Functional Requirements

1. The following information is to be used for price estimating purposes. The final requirements will need to be determined.
2. Eight hoppers per bay of flow rack. Each bay is 99" long. → per side of flow rack
3. Hoppers should have a modular design, with the ability to install different size buckets in different bays. For example some bays with 4 hoppers or 6 hoppers per bay mixed with bays of 8 hoppers per bay. Reg = 8 & big 6/bay
4. The area for hoppers should be 32 bays long (264').
5. The dump area will extend past the end of the hopper portion of the machine.
6. The hoppers can be constructed of any material that will provide the necessary function and durability. Plastic, metal or other materials should be considered.
7. The nominal size for the hoppers should be 1' wide in the down aisle direction and 2' deep in the cross aisle direction, final size to be determined.
8. For price estimation the system should have 12 aisles (12 machines), with 32 bays and 8 hoppers per bay. x 2 sides
9. The hopper design shall be safe for pickers to be in close proximity to the hoppers, and provide an area for mounting the Walgreens Pick To Light system (PTL).

512 / line
x 12
6000
buckets
DC.

Control System

1. Walgreens will determine what buckets the pickers shall pick into and provide an indication to the picker via pick to light.
2. When an order is ready to release onto the collection belt Walgreens will send a list of buckets to be dropped and the order number that the buckets correspond to. The PTB control system will then assign a section of belt to that order. As that section of belt passes hoppers that correspond to that order the hoppers will release product onto the collection belt.
3. The PTB control system will track the belt speed and control the opening and closing of the buckets.
4. The time that the hopper is held open shall be adjustable.
5. When a hopper is closed a signal will be sent to the Walgreens system.
6. The PTB control system will control the indexing of totes in and out of the dump station.
7. Overfilled totes will be detected by the PTB control system and diverted to a correction/audit station.

may have too many buckets

send Flag. with hopper list

8. If directed by the Walgreen's control system the PTB system will divert totes to the audit station for audit or direct a specific tote number to the audit station/error correction.
9. The length of space on the collection belt dedicated to an order shall be adjustable, and the space between orders on the belt shall be adjustable. – maybe send belt length 1-5 with order #

Dump Station

1. The pick to bucket system will include a dump station that will include the following functions.
2. Totes will be fed to the dump station one at a time from a conveyor system supplied by others. The PTB system will include any conveyor needed to control the indexing of totes. A signal will be sent the external conveyor system to control the flow of totes.
3. The dump station will lift the lid of the tote and automatically apply a shipping label to the top of the tote. – side scan – will send label info
4. After the tote has been filled and labeled the lids shall be closed automatically. to server
5. When required, a signal shall be sent to the external conveyor control system to divert a tote for various reasons, overfilled, audit or other reasons that may be required. Divert included
6. The dump station shall be able to handle a minimum of 400 totes per hour, with a goal of handling ~~900~~ totes per hour. 600

7. Verify label at dump station
8. Be able to handle corregated,
9. sticker device at dump station

Product To Be Handled

1. The product to be picked into the hoppers is any product that Walgreens sells that will fit into the hopper size selected.
2. Examples of product would Health and Beauty aids, OTC drugs, Shampoo, etc.
3. Some product would be excluded due to packaging, such as loose lids, or fragile product, like light bulbs.
4. Consideration in the design should be given to handling the product as gently as possible to handle the greatest number of delicate product possible.
5. The system shall be able to handle round product.

9. Conveyor system will feed a tote or bag
10. # Buckets / order ~~max~~ EST. ave. 6 > 7 hopper / bag

How many repacks for PR?

Give us air requirements & price for compressor ~~we supply compressor~~

Do we want smaller label?

Exhibit D

Pick-To-Bucket
Order Processing System Proposal
For
Walgreens Corporation
June 30, 1999
SI Proposal No. 00-WDS-013 Rev 1

TÜV ISO 9001

Exhibit D

THE SYSTEMS INTEGRATORS

SI HANDLING SYSTEMS, INC.

600 KUEBLER ROAD, PO BOX 70, EASTON, PENNSYLVANIA 18044-0070
TEL: (610) 252-7321 FAX: (610) 250-9677

June 30, 1999

Mr. Sean McGonagle
Walgreens
600 Wilmot Road
Deerfield, IL 60015-4616

Subject: Pick-to-Bucket Order Selection System
Reference: SI Proposal 00-WDS-013

Dear Sean:

We are pleased to offer this proposal to design, build and commission a Pick-to-Bucket Order Selection System for Walgreens.

I hope this proposal is satisfactory, and we look forward to working with Walgreens to develop and implement this important new technology.

Please do not hesitate to call me if you have questions.

Sincerely,

Pete Marri

Pete Marri
Key Accounts Manager
Warehouse & Distribution Systems

Exhibit D

CONTENTS

1.0	Scope of Work
2.0	System Design Criteria
3.0	System Description
4.0	Bucket Module Description
5.0	BRTS Controls
6.0	Pricing
7.0	Schedule
8.0	Standard Terms and Conditions

A PICK-TO-BUCKET SYSTEM FOR WALGREENS

1.0 Scope of Work

SI proposes that this project be divided into two concurrent phases:

Phase I – Design and prototype
Phase II – System build and implementation

The scope of these phases is as follows:

1.1 Phase I

- Based on Walgreen's design
- No simulation

- Detail design of 16 bucket module
- Build prototype of module – 8'-0" module
- Design bucket tooling
- Test and finalize design – timing dumps make sure product dumps
- Create and deliver Control System Specification
- Deliver firm pricing for Phase II

During Phase I we expect to work closely with Walgreens on the system design. To ensure a seamless integration, Walgreens will have final approval of the design during Phase I before beginning Phase II.

1.2 Phase II

- Place order for bucket tooling
- Develop Bucket Release and Tracking Control System (BRTS)
- Build, install, and commission complete pick-to-bucket system

As part of Phase II to complete the system design, installation and commissioning, the following will be provided:

- Mechanical engineering design, drawings, and bills of material, as required.
- Electrical engineering design, schematics, panel layouts, and bills of material, as required.
- Software engineering, i.e., control logic to accomplish conveyor control, release orders onto the collection belt, and transfer the orders into labeled totes.
- Software engineering, setup, and configuration for the host interface, bucket release and order tracking system.
- Supervision, as appropriate.
- Installation and field wiring

The concepts and features of the design depicted herein are the property of SI Handling Systems, Inc. and are submitted in confidence. Permission to use in any way this proprietary information is expressly withheld by SI Handling Systems, Inc.

1.3 Walgreens Responsibilities

- Totes
- Flow rack
- Lead in and takeaway conveyor, error correction spur
- Pick-to-light
- Order picking and management software
- Pick bucket indicator lights and acknowledgment buttons
- Main power and air drops
- Expenses for Phase I

2.0 System Design Criteria

The system design will consider the following criteria and assumptions :

- Pick-to-bucket System to handle all HABA, OTC drugs, general merchandise, and round products which are stored in the flow rack
- No poorly packaged or fragile products will be handled
- System will be modular in design
- Mechanical design will have 16 buckets per 98" bay of flow rack
- Nominal bucket size = 1' (down aisle) x 2' (cross aisle)
- Each aisle will have 32 bays, 16 buckets per bay
- Product transfer station with tote indexing controls will be supplied
- Minimum design rate of 400 totes/hour
- Automatic application of shipping label to side of tote
- System will be safe for pickers
- When order is ready, Walgreens will send order information, including list of buckets, to the Pick-to-bucket (PTB) control system. The PTB control system will release and collect the order to be deposited in the tote.

3.0 System Description (refer to drawing D-00-WDS-013-1, sheet 3 of 3)

The system consists of a series of pick buckets that are positioned over a collection belt. This belt will run in the center of two isles of flow rack (flow rack provided by Walgreens). Manual Pickers will pick product from the flow rack and place the items into a bucket indicated by a light (light provided by Walgreens). When all the picks for an order in the aisle are complete Walgreens will provide the PTB control system with order information including the buckets that make up the order. The PTB control system will assign a space on the collection belt for the order and the buckets will drop the product onto the assigned section on the flighted belt. The belt will transport the order to the transfer station. The transfer station moves empty totes into position, deposits the order into the tote and indexes the filled tote out of the transfer station.

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4.0 Bucket Module Description (refer to dwg D-00-WDS-013-1, sheets 1,2 of 3)

The system will be designed with nominal 99" long modules to match standard flow rack sections and to allow easy installation and maintenance. Each module will be comprised of a structural frame, pivoting buckets, and bucket release mechanisms. The modules will straddle a standard, cleated, Interlox collection conveyor belt, approximately 21 inches wide. Modules will be pre-assembled and pre-wired, with two rows of 8 buckets each; bucket size will be approximately 1 foot wide by 2 foot deep.

The frame, constructed of rectangular steel tubing, is a simple ladder type structure with 4 vertical support legs and cross members with central spines that support the bucket release mechanisms and cable tray for the electrical wiring. Frame members will be painted with high gloss machine enamel, color per Walgreens specification.

The buckets pivot on shafts attached to the side braces of the frame. Buckets are 5-sided hoppers constructed of molded plastic. When released, the buckets will tilt downward to deposit their contents onto the central collection conveyor. The buckets are manually reset by a lever type handle.

The release mechanisms under each bucket are electric solenoids, actuated by the controls, to drop the bucket. The contents slide out of the bucket, onto a slide pan and then onto the conveyor. This bucket/slide pan interface is designed to provide a soft impact for the bucket and its contents, and also to reduce the level of noise. It also provides sufficient clearance from product on the belt, to prevent jams and interference.

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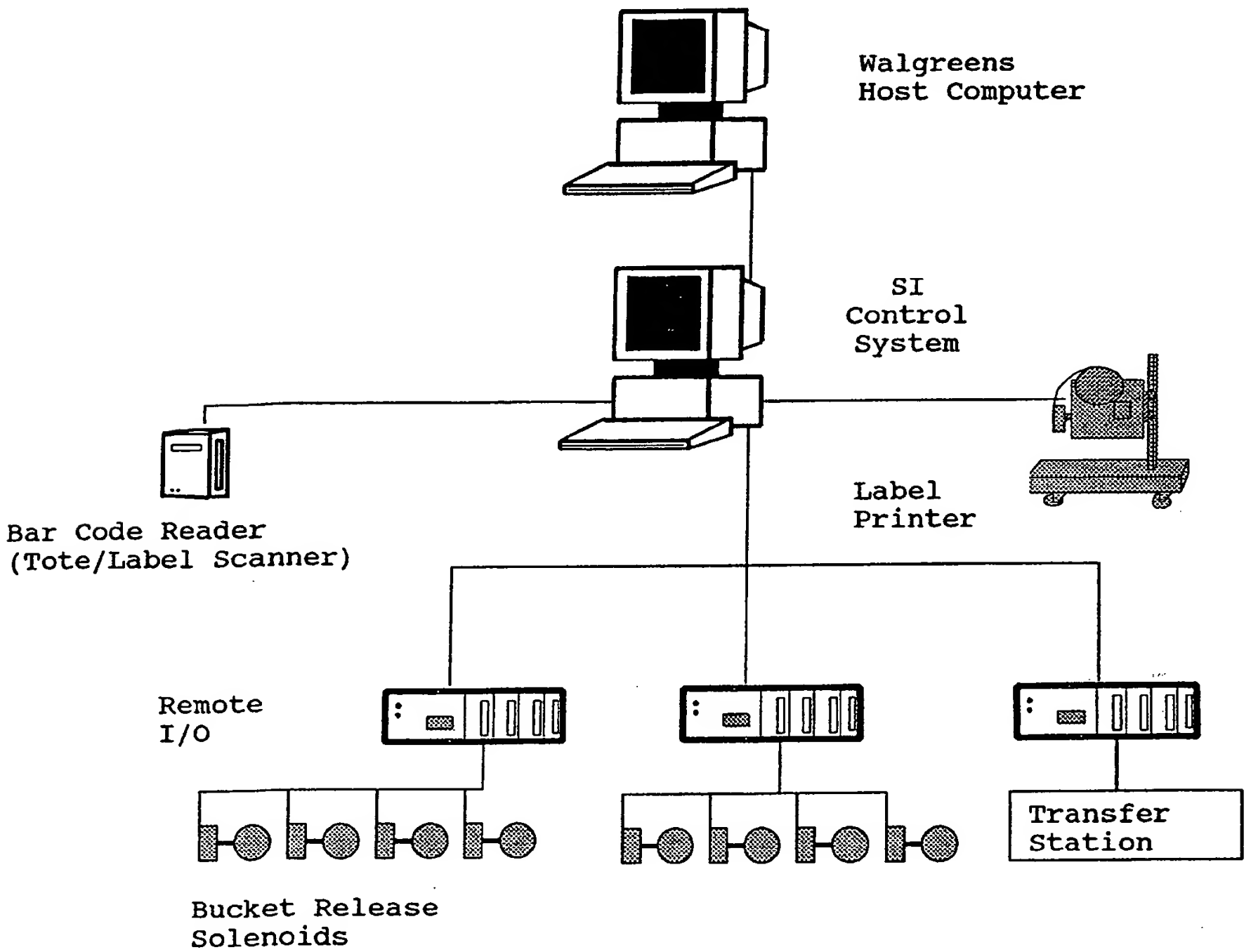
5.0 BRTS Control System



The SI Bucket Release and Tracking System (SI-BRTS), consists of one computer for each aisle, equipped with a printer, monitor, I/O interface card, Host interface card, and software to interface with the customer's Host computer. The Host interface may be either Token Ring or an Ethernet interface. All host/SI-BRTS messages will be communicated via a flat ASCII format using file transfer protocol or Socket to Socket interface over the network.

The concepts and features of the design depicted herein are the property of SI Handling Systems, Inc. and are submitted in confidence. Permission to use in any way this proprietary information is expressly withheld by SI Handling Systems, Inc.

The Primary functions of the SI-BRTS are to:

- Accept bucket release instructions from the Host
- Provide an operator interface
- Manage the tote tracking, labeling and order tracking
- Generate reports
- Provide data back to Host

The PC Based SI-BRTS Controller is designed to communicate to the conveyor controls, barcode reader, label printer, transfer station and operators. If a database is required, the data will be stored in a Microsoft Access Database. This provides a simple and reliable interface to all of the operators and equipment.

SI-BRTS will receive Order Data with the following information:

1. Unit Number
2. Date
3. Tote Box Number
4. Store ID
5. Address 1
6. Address 2
7. Address 3
8. Address 4
9. ID Character
10. Box Flag
11. ORM-D Flag
12. Order Description
13. Wave Number
14. Source
15. Short or Error Code
16. Order Belt Space
17. List of the Buckets to release

The PC will allocate a space on the collection belt based on the order belt space parameter downloaded from the host or, as an alternate, the number of buckets in the release list.

Option 1:

WAG. record sent down

Order belt space = (Number 1 through 100) X (Space factor)

(%)

Option 2:

Allocated Belt Space = (Number of Buckets) X (Space per Bucket)

The concepts and features of the design depicted herein are the property of SI Handling Systems, Inc. and are submitted in confidence. Permission to use in any way this proprietary information is expressly withheld by SI Handling Systems, Inc.

The Order Belt Space Factor or Space per bucket will be a configurable parameters stored in the configuration data for the SI-BRTS system. The control system will track the order as it moves toward the transfer station and will print the bar code label for each tote before the tote enters the dump position. The Label Printer will apply the label to the tote and the tote will move forward through the bar code reader. The reader will read the bar code label and the system will verify the tote has a valid bar code and the order being dumped into the tote matches the order on the belt. The tote is moved out of the transfer station and tracked to the exit point of the SI conveyor. If the status indicates the order was short or if an error is detected during the labeling process the tote reject status will be set for the conveyor system to reject the tote.

5.1 Application Description

The application will have security levels for the System Operators, System Supervisors, or System Managers. The menu driven interface allows a supervisor complete access to all products in the database.

In addition to normal operation, the Supervisor and Manager will have the ability to:

- View Order Data
- Update/modify Order information
- Add Orders to the database
- Delete Orders from the system
- Print a report for an order
- List logged transactions and system errors

5.2 Control Hardware Description

The following hardware is provided with the SI-BRTS system:

(1) PC 400 MHz Pentium II or faster, 128 MB RAM (Backup if required)
(1) Network Interface card (100mbps)
(1) 24 port network hub
(1) Laser Printer

5.3 Software Description

The following software is provided with the SI-BRTS system:

Operating System - Windows NT 4.0
Compiler/Development Environment -Visual Basic 6.0
Communication Software-FTP, Sockets
Database- MS Access
Applications- SI-BRTS, dB utility

The concepts and features of the design depicted herein are the property of SI Handling Systems, Inc. and are submitted in confidence. Permission to use in any way this proprietary information is expressly withheld by SI Handling Systems, Inc.

REDACTED

Exhibit D

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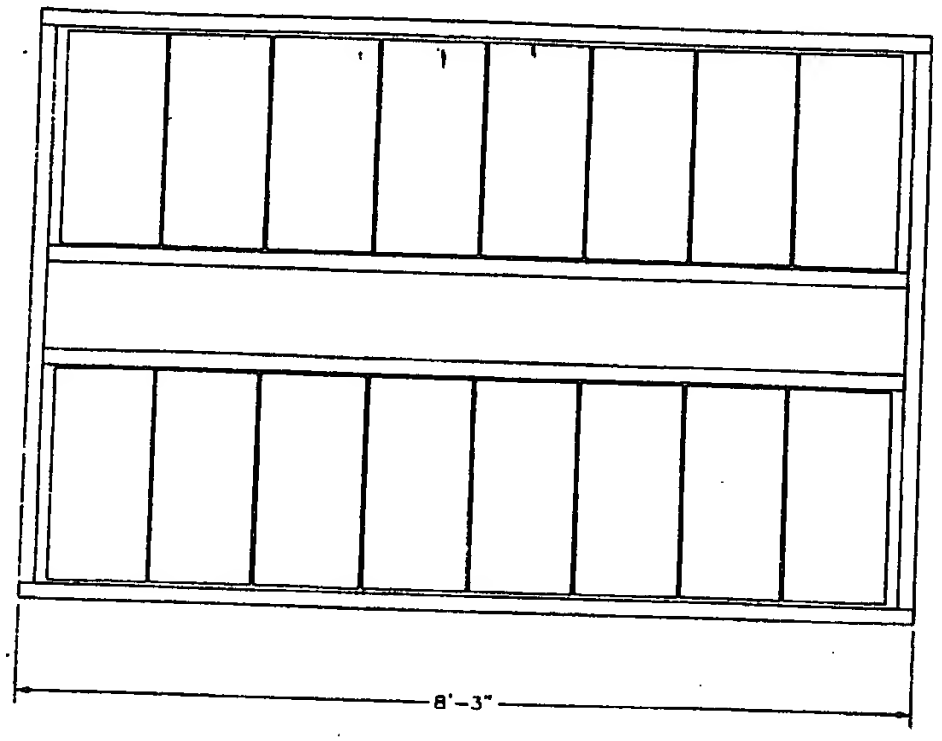
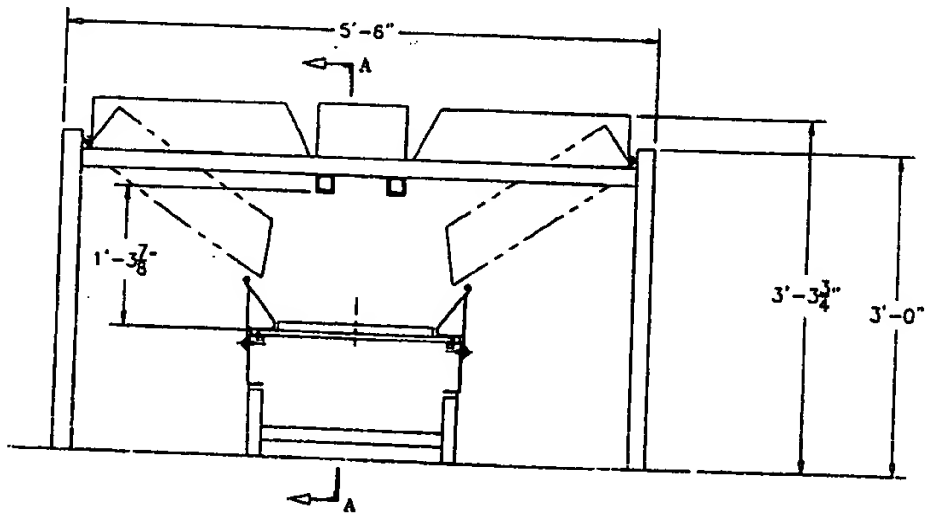
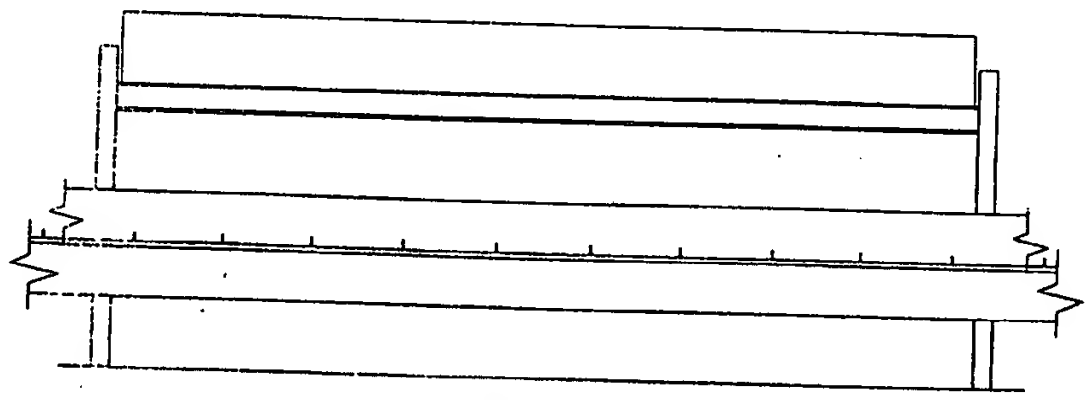






SECTION A-A

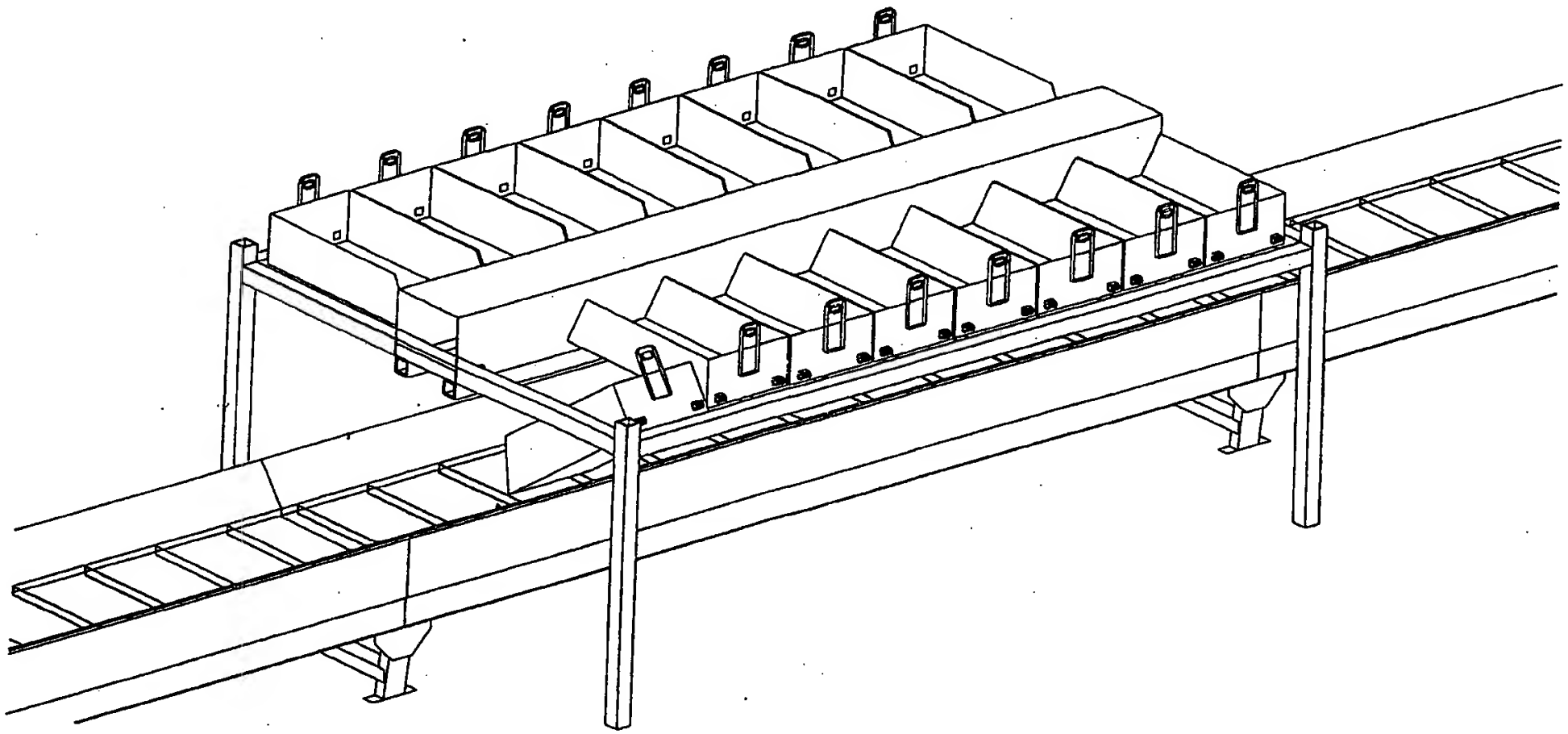
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED

REV	ECO No.	DATE	BY	CHK

DR. K.K. Khoo (Khoo)
CHK.
APR.
SCALE 1/8" = 1"
REV: ECO:

CONCEPTUAL H-FRAME MODULE

DRAWING NO. SHEET 1 OF 2
D-00-WDS-013-1



ALL SECONDARY DIMENSIONS ( ) ARE FOR REFERENCE ONLY AND SHOULD NOT BE USED FOR PRODUCTION

REV	ECO No.	DATE	BY	CHK.

ALL DIMENSIONS ARE INCHES UNLESS OTHERWISE SPECIFIED

DECIMAL UNITS	
X.X	± 0.060
X.XX	± 0.030
X.XXX	± 0.010
FINISH ROUGHNESS	125

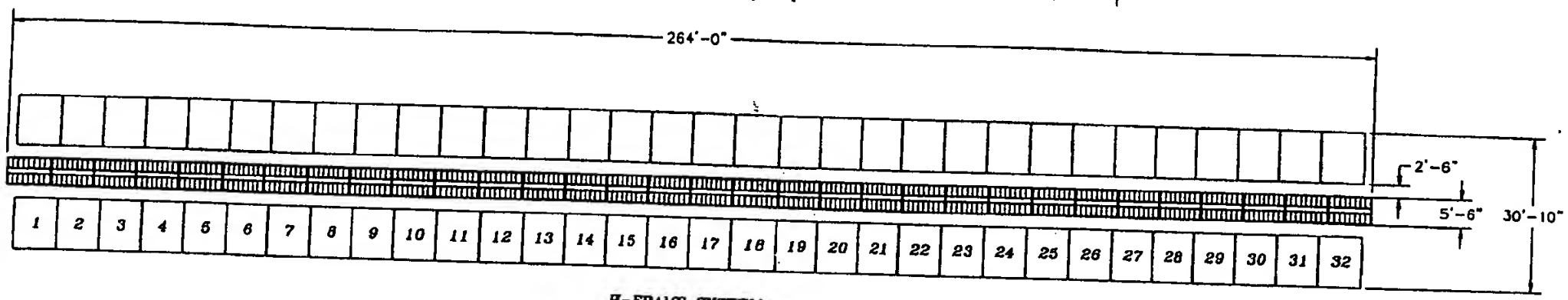
METRIC UNITS	
X.Xmm	± 0.1mm
X.XXmm	± 0.1mm
X.XXXmm	± 0.13mm
FINISH ROUGHNESS	1.6

DR. B.K. Knox 03mar99
CHK.
APR.
SCALE No Scale
REV. ECO#

E-FRAME MODULE ISOMETRIC

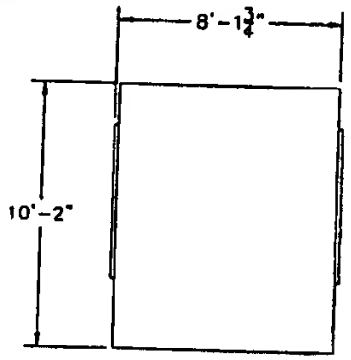
CAD NO:0000251151

DRAWING NO.
SHEET 5 OF 5
D-00-WDS-013-1



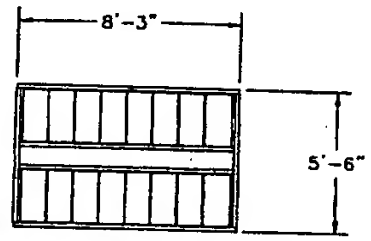
H-FRAME SYSTEM

SCALE: 3/32" = 1'-0"



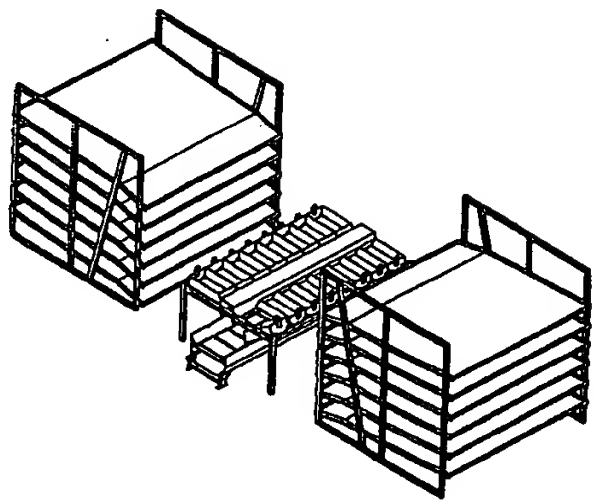
TYP. FLOW-RACK

SCALE: 3/8" = 1'-0"



TYP. H-FRAME MODULE

SCALE: 3/8" = 1'-0"



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REV	ECO No.	DATE	BY	CHK

ALL DIMENSIONS ARE INCHES UNLESS OTHERWISE SPECIFIED

TOLERANCES/FINISH (UNLESS OTHERWISE SPECIFIED)

ENGLISH UNITS: X.X ±0.060, X.XX ±0.030, X.XXX ±0.010, FINISH 125

METRIC UNITS (EX): X.Xmm ±1.5mm, X.XXmm ±0.8mm, X.XXXmm ±0.13mm, FINISH 3.2

DR. B.E. Dietz Elkhardt	
CHK.	
APPR.	
SCALE	AS NOTED
REV.	ECO:

CONCEPTUAL SYSTEM LAYOUT

CAD NO: D00035154

DRAWING NO. D-00-WDS-013-1

SHEET 3 OF 3

4/11/00

HAF

Claims - Knapp

- commissioning system - trays, conv.s groups of trays, RF terminals, person assigned to terminal & primary & sec. Zone
- quitting switch
- indication light
- tray, with downward pivot
- trays above conveyor
- continuous drive for conveyor
- control computer
- plurality of shelves
- conveyor divided into segments
- additional conveyors & HAF's
- checking means
- means for special products

Walgreens Claims

1) ✓ - Use PTL to direct picker (commissioner)
   - faster - no time lag for recognition time
   - more accurate
   - more flexible - add more pickers w/o adding terminals
2) ✓ - Pick Arrow Indicator - directs pick to correct area of pick
   - faster - Alpha Name for bucket
3) ✓ - Display Bin (Tray) location on rack
   - faster - picker knows when they turn where pick will be, DON'T
4) ✓ - No quitting Switch - Pick acknowledged by hitting next button on storage rack - eliminate the step of

4/11/00

5) ✓ - Special Pack Zone for delicate product - more items can be picked from machine, less damage, ~~more~~ better productivity
Don't drop product → Need drawing of pack station

6) ✓ - Device that automatically closes lids - saves manual labor to close lids.

(DON'T CLAIM)

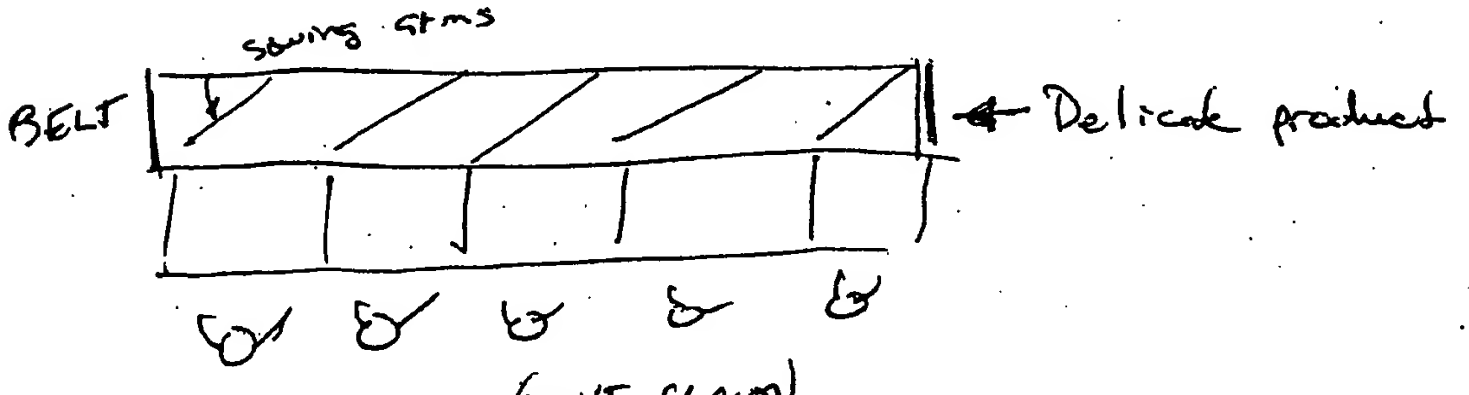
7) ✓ - Tray Design ? In description specified gears for opening trays. - we use cylinders. Air Billows Less expensive

(DON'T CLAIM)

low Rack ~~is~~ instead of Shelving -
Faster - more items are stored closer to trays, ~~faster~~ less walking time.

Dynamically.

9) ✓ - Flexible Zones ? Indicators on rack dynamically assign zones to pickers.



(DON'T CLAIM)
- Cleated Belt - round product will convey

✓ - Pick portion of trays going way & pick another portion going back -

✓

4/11/00

TO DO: (2 weeks)

- drawing of Pack stations → Sean & description

- Description of pick method - Randy

- Focus on PTL system with Buckets

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